

Summary Implementation Strategy, Dams only

Overview

The goal of the temperature TMDL for the Columbia/Snake River mainstem is to establish load and wasteload allocations that if achieved, would enable the rivers to meet the applicable water quality standards for temperature established by the Spokane and Colville Tribes and the states of Oregon and Washington. The goal of water quality standards is to protect beneficial uses of the river. The most temperature-sensitive use is providing suitable habitat that supports propagation of anadromous salmonids. These species are particularly vulnerable to degraded temperature conditions during certain times of the year. Achievement of temperature criteria may be possible without negatively impacting other beneficial uses. Some of the anadromous species use the mainstem rivers for spawning and rearing, and anadromous fish use the mainstem rivers for migrating downstream as juveniles and returning upstream as adults.

The temperature TMDL identifies the increased water column and surface area exposed to solar radiation and air temperature in reservoirs formed upstream of the dams along the mainstem as the main sources of increased average thermal load in excess of modeled site potential during the summer and fall seasons. The dams are the main focus of the implementation strategy although the point source inputs of thermal load are also addressed through routine updates of permit conditions. Sources outside of the mainstem including tributaries are not included in this TMDL and will be addressed individually in other actions.

The implementation plan for a TMDL contains the procedural actions that will be taken to achieve the water quality standards, a schedule for implementing the actions, the process for establishing benchmarks of success, a monitoring plan, and feedback mechanisms for iterative management. For the Columbia/Snake River mainstem Temperature TMDL, the Detailed Implementation Plan will be complex and a number of years in the making. This is because the TMDL identifies temperature improvements at many of the dams on the rivers as necessary to make progress towards achieving WQS. The development and implementation of feasible temperature improvement measures at the dams will require studies, time and resources. Determination of the feasible **operational or structural modification** alternatives will also require the cooperation and coordination of the dam operators, the states and indian tribes responsible for TMDL implementation, and the Federal Agencies that implement the Endangered Species Act.

This Summary Implementation Strategy (SIS), which will be issued concurrently with the TMDL, includes an initial list of actions for improving temperature at the dams. However, many of these actions are studies to clarify issues, address environmental impacts, determine feasibility, design improvement measures, or quantify the benefits of improvement measures. So the list of improvement actions, which constitutes the initial implementation plan, will change as studies are finalized, decisions are made, and funding is secured from Congress. The

implementation plan will therefore be dynamic. To manage this dynamic implementation plan, this SIS includes an interagency management process and structure. The process and activities described in the SIS may be revised with the issuance of the Detailed Implementation Plan (DIP) in the future. The DIP will be issued after it is developed from new information gathered during the short term phase of implementation. This document does not alter or diminish the authority held by the agencies that participated in its development.

The TMDL found that temperature improvements at the point sources on the river that are subject to NPDES permits will not significantly contribute to attainment of the water quality standards. While temperature improvements from nonpoint sources will improve water temperature in the mainstems, they will not remedy the temperature problems caused by the impoundments formed behind the dams. Improvement of temperature in the mainstem is necessary to achieve temperature water quality standards. The level of improvement due to different operations or by feasible structural modifications at the dams is not known at this time. Once this information is available, it can then be determined whether the level of improvement at the dams called for by the TMDL is achievable for the entire mainstem and at all times. At that point, if the water quality criteria are not attained, amendment of the water quality standards either through site specific criteria or a use attainability analysis would be appropriate.

The federal regulations contain a provision for adjusting the water quality criteria when a beneficial use is not attained due to **the presence of dams**. A subcategory of a beneficial use may be established if it can be demonstrated that the original use is not feasible because dams preclude the attainment of the use. A requirement of this regulation is that in order to allow a revision of the beneficial use, that it not be "feasible to restore the [river] to its original condition or to operate [the dam system] in a way that would result in attainment of the use." This is an important issue for the recovery of endangered and threatened species of salmonids in the Columbia and Snake Rivers. Methods of operation and structural modifications to the dams are being studied for the effects on salmonids. Measures that are feasible will be implemented. If those feasible measures alone do not lead to attainment of the temperature standards, the states may initiate a use attainability analysis to modify the designated use ^{that} which could lead to an adjustment of the water quality standard. ~~A question of the feasibility of dam breaching may be examined.~~ **Until then, the states have expressed that it is premature to consider dam breaching a requirement in order to meet the objectives of the temperature TMDL.**

This SIS lays out an agreement process between the states and the tribes with jurisdiction over water quality standards and the federal agencies and public utility districts that operate the dams and manage the hydropower system. This process is for developing recommendations to improve river temperature and meet the standards for temperature.

This SIS contains the following components:

- An initial implementation strategy in the form of a list of proposed or potential actions to be taken or studies to be conducted to reduce temperature degradation identified in the TMDL. The strategy includes time frames and lead responsibilities;

- An interagency management process for iterative management of the Implementation Plan;
- An agreement process between the water quality agencies and the dam operators to document that the dams are in compliance with the TMDL or working toward compliance through the mechanisms authorized within the Clean Water Act;
- A discussion of Use Attainability Analysis, site specific criteria, and voluntary pollutant trading.

Participants

The governmental agencies responsible for dam operation or hydropower management, state federal and tribal agencies that have implementing authority or an interest in improving temperatures in the mainstem all participate in the development of the DIP and alternatives for system and individual dam operation.

Initial Implementation Plan

The initial implementation plan is divided into short term and potential mid and long-term actions. Short-term actions will involve developing system-wide operational strategies that reduce water temperatures, researching methods to meet the load allocations, and evaluating water temperatures in fish passage habitat in accordance with the National Marine Fisheries Service's Biological Opinion. System-wide operational strategies may be developed when the options available to improve temperature are better understood. The strategy of improving water temperatures in the main stem Snake River by upstream cold water releases from Dworshak Dam is an example of a system-wide strategy. Such temperature management strategies are not structured towards achieving the seasonal natural site potential as determined from modeling exercises. Instead, cold water releases are scheduled during July through September to moderate water temperatures in the Snake River that are naturally warmer than 20 C. Fish passage structures can experience localized exceedances of the temperature criteria. Measures that provide cooler water within those structures are a high priority for both ESA and CWA, and would require careful consideration due to the potential effects on listed species.

The initial short-term implementation activities (Table 1) were specified as part of the Reasonable and Prudent Alternative (RPA) in the National Marine Fisheries Service's Biological Opinion (BiOp) on the operation of the Federal Columbia River Power System (FCRPS) dated December 2000 prepared under the federal Endangered Species Act for 12 listed species in the Columbia and Snake Rivers. The BiOp recognizes the importance of temperature improvements in protecting endangered species by establishing specific actions in the RPA, and recommending actions identified as Conservation Recommendations. **The activities and studies for improving river temperature that are already in place due to the BiOp and constitute the core of short term actions to also demonstrate ongoing compliance with the CWA.**

The BiOp also contains Appendix B "Development of a Water Quality Plan for the Columbia River Mainstem: a Federal Agency Proposal." The water quality plan called for in the document

has been drafted and can be found at
<http://www.nww.usace.army.mil/reports/waterquality/wqp2003.pdf> The "Water Quality Plan for Total Dissolved Gas and Water Temperature in the Mainstem Columbia and Snake Rivers" was a collaborative effort of Federal agencies, state and tribes. The plan identified the BiOp actions, potential additional actions, and studies that should be conducted to clarify issues, design improvement measures, or quantify the benefits of improvement measures.

Table 1 describes each action, the reference to both the BiOp and the ~~W~~Water Quality Plan for ~~Total Dissolved Gas and Water Temperature in the Mainstem Columbia and Snake Rivers~~, and the current status of those actions.

Table 1: Initial Short-term Implementation Activities

Action Item Description	Biological Opinion Action Item #	Mainstem Water Quality Plan Action Item #	Status
The Corps, in coordination with USFWS, shall design and implement appropriate repairs and modifications to provide water supply temperatures for the Dworshak National Fish Hatchery that are conducive to fish health and growth, while allowing variable discharges of cold water from Dworshak Reservoir to mitigate adverse temperature effects on salmon downstream in the lower Snake River.	33	S-1	Completed 2003
The Action Agencies shall evaluate potential benefits to adult Snake River steelhead and fall Chinook salmon passage by drafting Dworshak Reservoir to elevation 1,500 feet in September. An evaluation of the temperature effects and adult migration behavior should accompany a draft of Dworshak Reservoir substantially below elevation 1,520 feet.	34	M-2	Field Test Completed in 2002 Data Analysis and reporting In Progress

Action Item Description	Biological Opinion Action Item #	Mainstem Water Quality Plan Action Item #	Status
The Corps shall examine existing fish-ladder water temperature and adult telemetry data to determine whether observed temperature differences in fishways adversely affect fish passage time and holding behavior. If non-uniform temperatures are found to cause delay, means for supplying cooler water to identified areas of warmer temperatures should be developed and implemented in coordination with the annual planning process.	114	R-2	Field Studies, Data Analysis and reporting In Progress
The Corps and BPA shall conduct a comprehensive depth and temperature investigation to characterize direct mortality sources at an FCRPS project considered to have high unaccountable adult losses (either from counts and/or previous adult evaluations).	115	R-1	Field Studies done in 00- 02, Suspended in 03, Planned for 04 Data Analysis and Reporting In Progress
The Corps shall operate the lower Snake River reservoirs within one foot of MOP from approximately April 3 until small numbers of juvenile migrants are present and shall operate the John Day pool within a 1 ½- foot range of the minimum level that provides irrigation pumping from April 10 to September 30.	20	M-3 A	Implemented Yearly

Action Item Description	Biological Opinion Action Item #	Mainstem Water Quality Plan Action Item #	Status
The Action Agencies shall evaluate juvenile fish condition due to disease in relation to high temperature impacts during critical migration periods. This evaluation should include monitoring summer migrants at lower Columbia and lower Snake river dams to clarify the possible link between temperature and fish disease and mortality. This information will be used to assess the long-term impacts of water temperature on juvenile fish survival.	141	R-7	Planned Through the Course of the BiOp
The Corps shall work through the regional forum process to identify and implement measures to address juvenile fish mortality associated with high summer temperatures at McNary Dam. As a starting point, the Corps shall assemble and analyze the temperature data that have been recorded in the McNary forebay, collection channel, and juvenile facilities. The Corps shall examine relationships among juvenile mortality, temperatures, river flow rates, and unit operations in detail. The Corps shall investigate the feasibility of developing a hydrothermal computational fluid dynamics model of the McNary forebay to evaluate the potential to determine optimal powerhouse operations or structural modifications for minimizing thermal stress of juvenile salmon collected in the summer and to conduct a modeling program, if warranted.	142	S-2a	Planned Through the Course of the BiOp

Action Item Description	Biological Opinion Action Item #	Mainstem Water Quality Plan Action Item #	Status
By June 30, 2001, the Action Agencies shall develop and coordinate with NMFS and EPA on a plan to model the water temperature effects of alternative Snake River operations. The modeling plan shall include a temperature data collection strategy developed in consultation with EPA, NMFS, and state and Tribal water quality agencies. The data collection strategy shall be sufficient to develop and operate the model and to document the effects of project operations.	143	R-3A, R-6	In Progress

Long term actions will require years to develop and implement. The federal actions will also undergo study and public process under the National Environmental Policy Act. Potential implementation actions shall be evaluated in context with other legal and social impacts. The other beneficial uses of the mainstem rivers, impacts on hydropower production, irrigation, navigation, fisheries, and recreation will be evaluated during this process.

Mid-term actions appear to offer the most feasible and probable opportunities to understand and improve temperature in the mainstem. Mid-term actions include localized improvements at those dams materially exhibiting an increase in temperature through its impoundment.

Most potential long-term actions require further study but include structural alterations and implementation of operational changes to dams to improve temperature in the rivers. **Long term actions will also, if necessary, involve a Use Attainability Analysis (UAA) to develop a subcategory for less than optimal fish propagation of the mainstem Columbia and Snake Rivers, describing the habitats for fish passage, localized fish spawning and rearing, and fish holding locations within the rivers and the temperatures needed to support those uses.** Most federal studies and associated implementation measures require funding approval and may require congressional authorization. **These studies may be conducted in concert with ESA consultation(s).** Potential Mid/Long-term Implementation Activities are included in Table 2.

Table2: Potential Mid/Long-term Implementation Activities

[this table will reflect the output from the water quality planning team]

Action Item Description	Biological Opinion Action Item #	Mainstem Water Quality Plan Action Item #	Status
Realign water intakes at Grand Coulee Dam		M-5A	
Alter the flood control curves	35	M-6	Planning Process
Investigate system-wide operational changes to improve water temperatures, <u>Hell's Canyon and Canada</u>		M-5C, M-7	
<u>Additional cool-water releases from Dworshak in July/August</u>		<u>M-1</u>	
Identify water temperature cooling and avoidance of heat increase methods at individual hydro projects	141, 142	S-2 A, B, C	S-2 A, C In Progress S-2B, None
Investigate selective operation of the Grand Coulee powerhouses for cooling		M-4	Planning Process
Investigate selective warm water withdrawals from Lake Roosevelt to Banks Lake		M-8	Planning Process
Investigate penstock selective withdrawals at Grand Coulee Dam		M-5B	Planning Process
<u>Develop multi-dimensional temperature model</u>		<u>R-3A</u>	
<u>Improve temperature data collection</u>		<u>R-3B</u>	
<u>Perform D-temp basinwide study</u>		<u>R-5</u>	

Use Attainability Analysis – [from Don Essig, Idaho]

Federal regulations implementing the Clean Water Act (CWA) allow for states and tribes to change their use designations (40 CFR 131.10) to better align those designations and water quality criteria with reality. Such a need may arise due to lack of precision in original designations or changes in the environment that have occurred over time. Reasons for adjusting a use may be natural or un-natural. The regulations recognize only six basic reasons a designated use may be unattainable. One of the basic reasons are dams and other hydrologic modifications. In no case are states allowed to remove a use that has existed on or after Nov. 28th, 1975. Such

“existing uses” are required to be protected whether recognized with a use designation or not.

States and tribes may also adopt subcategories of use, which go beyond the “fishable and swimmable” minimums required of all waters by the CWA. The regulations offer the distinction between cold water and warm water fisheries as an example of subcategories of use. Many states have used salmonid spawning designations to protect the higher water quality generally needed for spawning trout and salmon on a seasonal basis. Thus, these subcategories typically carry their own water quality criteria, such as a lower temperature or higher dissolved oxygen, than their parent use.

Because of the CWA’s directive to restore and maintain the integrity of the nation’s waters, and “wherever attainable” provide water quality which protects aquatic life and recreation, changes in use are treated with great circumspection. Therefore, whenever a use is changed an analysis is required to demonstrate what remaining uses are still attainable. A designated use may be changed only if this analysis shows it to be unattainable, and the replacement use adopted must be the highest that can be attained. Subcategories of use, especially if they would lower water quality criteria, also require a use attainability analysis.

Any change in use must go through state (or tribal) rulemaking procedures. Rulemaking is an laborious public process, requiring board approval, and, in some states, legislative approval as well. As with all changes to state and tribal water quality standards, the Environmental Protection Agency has oversight and final approval authority over such changes. Any change must be final before a TMDL can be written for the new standards. Since endangered salmon are present within the TMDL “action area”, EPA’s decision is subject to consultation under the Endangered Species Act.

Even with the above in mind, it seems likely evidence will accumulate that temperature criteria in Columbia mainstem need to be changed. Some say that evidence of unattainability already exists. **However, the State believes there is not yet sufficient available information and data to specify what temperature criteria are attainable. Without that detail States can not adequately make the required demonstration that a UAA requires. In the meantime, a TMDL must be written to meet current standards, even though the current standards may not be attainable, and are likely to change over time. is The State commits to re-evaluating standards and preparing a use attainability analysis if and when sufficient information exists to support it.**

Interagency Management Process

An interagency Water Quality Implementation Plan Workgroup (WQIPW) will be developed to manage the system-wide implementation plan. The workgroup will form within one year after finalization of the TMDL and be chaired on a rotating basis by the States of Oregon and Washington and Colville and Spokane Tribes. Members will include the action agencies, the states and tribes, EPA, and others with interests in the water quality of the

Columbia and Snake River mainstems. Inclusion of all these parties will facilitate coordination of this implementation plan with activities required under the BIOP and other basin wide efforts. The activities of this workgroup will be as follows:

- Monitor completion of required improvement actions and studies;
- Work with lead agency managers to ensure actions are completed on time;
- Establish due dates when not already established in Table 1;
- Develop the criteria by which temperature reduction proposals will be prioritized;
- Evaluate study results;
- Accept studies or ask for changes;
- Make ~~recomend~~ recommendations on proceeding with actions based on study results;
- Make ~~recomend~~ recommendations on whether actions are feasible based on study results;
- Oversee a joint WQS revision process if appropriate in the future.
- Develop a process to prioritize and recommend allocation of resources

The participants will staff the workgroup and participate in the decision-making. The members will make all reasonable efforts to achieve consensus. During the initial meetings of the WQIPW, the process for achieving consensus will be further defined. When consensus cannot be achieved in the group, the objecting member may request that the issue be elevated to the state or tribe with jurisdiction. The ultimate Clean Water Act determinations will be up to the state and tribe with jurisdiction.

There are a number of workgroups or teams already in existence working on this issue.: the NOAA Fisheries Forum Water Quality Team which addresses issues in implementing the BiOp and the Ad-hoc Water Quality Planning Team which developed the "Water Quality Plan for Total Dissolved Gas and Water Temperature in the Mainstem Columbia and Snake Rivers". The workgroup could be a combination of these groups and perhaps serve the purposes of all.

Agreement Process between Water Quality Agencies and Dam Operators:

Agreement between dam operators and water quality agencies is a statement by the water quality agency that the operator is doing what needs to be done to comply with the Clean Water Act. These agreements can be documented in three ways:

1. 401 Certification for non-federal dams;
2. Temperature Management Plans submitted by the Operator and approved by the state or tribe;
3. Documented Agreement to act on ~~recomend~~ recommendations from the WQIPW.

401 Certification

The load allocations for the PUD dams on the mid Columbia River will be incorporated into the FERC 401 Certifications. Participation in the WQIPW will be a condition of 401 Certifications, particularly where the Load Allocation (LA) cannot be consistently met by the dam operator without new activities to reduce temperatures in the impounded reservoir. Schedules of compliance may be included in the Certifications or through an independent state water quality administrative order that specify submittals of reports and updates toward progress in complying with the load allocations. See Appendix for the schedule.

Temperature Management Plans/Compliance Orders/Water Quality Plans

[This whole section may be replaced with a discussion of mutually agreed water quality orders that would serve the same purpose as was intended for the TMPs. The Nt concept may also change as a result of ongoing discussions between the states and the action agencies.]

The most stringent water quality criteria for temperature that is driving the need for the greatest temperature reductions in impoundments is the Oregon criteria for a maximum 0.14°C increase over natural background from the period from August 1 to November 1. Also included in the water quality standards for Oregon State is the ability to demonstrate compliance with the standard in the short term by preparing and implementing a Temperature Management Plan. Since dam operators in Idaho and Washington State are subject to meeting the load allocations based on -water quality standards of Oregon State, it is also fair to offer these dam operators this short-term opportunity to demonstrate compliance.

The state of Oregon will consider approval of submittals from the COE dams along the Oregon /Washington border. Plans submitted to Oregon to satisfy the Oregon standard may also address measures that are proposed to meet the criteria from Washington state that drive the seasonal allocations between November 1 and February 1. The state of Washington will consider approval of submittals from the other dams within the study area. Plans submitted to Washington to satisfy the Oregon standard should also address measures that are proposed to meet the criteria from Washington state that drive the seasonal allocations between November 1 and February 1. The Spokane and Colville Tribes will be included in the approval process for Submittals regarding Grand Coulee Dam.

All dam operators are required to design and implement a monitoring system at its dam for the purpose of quantifying the cross-sectional average temperatures and localized temperature improvements. Temperature monitoring results from the first two seasons of monitoring will be compared to the modeled natural river thirty year average temperatures (Nt). If the current temperatures exceed the Nt, the dam operator is required to submit a temperature management plan to the respective state. The surface water temperature management plan shall describe the best management practices, measures, and/or control technologies which will be used to improve the temperature of the impoundment upstream of its dam. The plan shall be submitted before the next monitoring season. The metric that triggers submittal of a temperature management plan is not necessarily the same metric that demonstrates non-compliance with the TMDL.

Dam operators shall continue to maintain and improve, if necessary, the surface water

temperature management plan to maintain the cooling trend until the numeric criterion is achieved or until the state or tribe has determined that all feasible steps have been taken to meet the criterion and that the designated beneficial uses are not being adversely impacted.

A dam operator in compliance with the approved surface water temperature management plan and fully participating in the WQIPW shall not be deemed to be causing or contributing to a violation of the numeric criterion even if the surface water temperature exceeds the criterion.

Documented Agreement with ~~Recommendations~~ Recommendations by the
Water Quality Implementation Plan Workgroup:

An option, in lieu of individual facility temperature management plans/compliance orders/water quality plans would be for operators and agencies to document their agreement with on-going ~~recommendations~~ recommendations of the WQIPW. The participation and implementation of actions recommended by the group and approved by the state or tribe with regulatory authority constitutes the equivalent of a temperature management plan.

Long Term

This phase will begin in 2010 and proceed through 2016. Actions taken in the previous phase will be reviewed for their efficacy in improving temperature levels.

Implementation methods for these actions will be provided in a Detailed Implementation Plan, or equivalent.

Voluntary Temperature (Pollutant) Trading

Pollutant trading can be an invaluable tool to meet water quality goals in an efficient manner. It is a market-based, business-like way to help solve water quality problems by focusing on cost-effective, watershed wide solutions to those problems. It is most valuable when pollutant sources face substantially different pollutant reduction costs. Typically, a party facing relatively high pollutant reduction costs compensates another party to achieve an equivalent, though less costly, pollutant reduction. This compensation, in many cases, may actually provide the other party with enough funds to meet or exceed their own load allocation responsibility under a TMDL in addition to the trade. The only exception to compensation would be between sources owned or operated by the same party. The result of trading is an overall improved water quality with the most cost-effective pollutant load reductions attainable.

The guiding principal of pollutant trading is that it must result in overall improvement in water quality within the watershed. A few basic points follow from this principle:

- Trades must occur within the same watershed; it is a means to improve water quality in the watershed, not mitigate degradation with improvements in other watersheds.
- Buying must generally move load reductions upstream, so that there is not localized lack of improvement.
- Sellers can only sell load reductions that go beyond their TMDL allocations or requirements, so that overall watershed load reductions are still met.

An important aspect of pollutant trading is that it is voluntary. Parties trade only if both are better off as a result of the trade. Pollutant trading does not create any new regulatory obligations because trading systems are designed to fit within existing regulatory frameworks. Another important aspect of pollutant trading is that individual allocations or load reduction responsibilities must be established before trades can take place, without assigned and quantified responsibility trades have no basis. A further aspect of trades is that they can be dynamic, shifting over time as economics and treatment capabilities change.

Trading allows various pollutant sources to decide how to best reduce discharges. This ties very well into a system-wide or watershed view of solutions. A successful pollutant trading program will create flexibility that allows common sense selection of pollutant reduction methods based on financial merit while ensuring water quality goals are met.

Although pollutant trading was developed to meet loads within the geographic scope of a TMDL, it may be possible for it to extend beyond set boundaries. This is facilitated if an entity owns or operates facilities both within the scope of a TMDL and upstream as well. A prime example of this is cold Dworshak releases to reduce water temperature increases caused by dams downstream on the Snake, though these actions are not formalized in a TMDL. Similar actions with respect to operation of the Hells Canyon complex, specifically Brownlee Dam, would require compensation of Idaho Power Company for cold water releases beyond those that may be required to meet water quality standards locally.

In order for the objectives of pollutant trading to be successfully met, procedures to record and track trades over time must be established. For the Columbia Mainstem TMDL this would require inter-agency / interstate agreement and a group to administer the trades. Idaho DEQ has already established the Idaho Clean Water Cooperative and procedures to track changes for the state of Idaho. This ready group could serve as the tracking entity for the Columbia Mainstem, or some other group agreed upon by the parties involved.

Adaptive Management

The process for reviewing the status of implementation of this TMDL will follow the timing and process for the review of the federal Biological Opinion in 2010. This may need to be modified.

The WQIPW made up of representatives of tribes and federal and state agencies will evaluate appropriate temperature control activities for this TMDL. Based on these findings, further studies may be needed, and temperature reduction activities will be redirected or accelerated if needed.

In its simplest form the adaptive management concept provides a strategy for moving forward in a technical field while in the absence of total knowledge about the consequences of this action. Under these conditions adaptive management allows the selection of the best informed management route or strategy, establishing a thorough monitoring system designed to quickly and accurately inform the observer if the strategy is on track and working as intended. If the results indicate otherwise then mid-course corrections are taken to keep projects and results moving in the desired direction. Each course alteration is accompanied by a modified monitoring plan.

The water quality criteria for the protection of beneficial uses may change in the future. When these changes occur, the wasteload and load allocations may be adjusted if needed to satisfy the new criteria.

Monitoring Strategy

Monitoring for TMDL compliance will consist of two components: short-term implementation monitoring and long-term effectiveness monitoring. A monitoring strategy is described below, and the DIP will contain a detailed description of monitoring. The monitoring program should include a Quality Assurance program reviewed by the WQIPW.

Short-term implementation monitoring will be established to evaluate specific implementation activities. As those activities are identified and plans developed, a monitoring component should also be developed for management of the activity. For example, target temperatures may be developed for management of the cold-water release from an upstream reservoir. The implementation monitoring for this activity would look at the success of meeting the target temperatures, while the long-term effectiveness monitoring would look at the overall effectiveness of this and other implementation activities over the long run. Short-term compliance and the effective of operational implementation actions will be monitored at existing fixed monitoring station sites.

Water temperature and TDG are currently monitored at each dam. The plan of action for TDG monitoring for 2003 (including temperature) can be found on the TMT website <http://www.nwd-wc.usace.army.mil/tmt/documents/wmp/>. This plan is produced annually in coordination with the Fish Passage Plan and provides greater detail for those who are interested. The details of the 2003 water-quality monitoring plan are in Appendix 4 of the annual Water Management Plan.

In general the water quality fixed monitoring stations are designed to provide information needed to control dissolved gas supersaturation in the river system on a real time basis, to determine how project releases affect downstream water quality, trend monitoring, and to provide data of known

quality to enhance analytical and predictive capability of existing models/tools. The data collected also measures temperature, as that is an integral part of analysis for total dissolved gas.

Since 1994, two different types of fixed water quality monitoring stations have been used. Forebay and tailrace monitors are maintained at each Corps hydroproject and record water temperature, and total gas pressure on an hourly interval during the fish passage season. This information is coupled with operational data and reported in near real time at <http://www.nwd-wc.usace.army.mil/tmt/wcd/tdg/months.html>. This information is often applied to spill management practices for the upstream project and is applied to water quality compliance monitoring as well. In general, the water quality sampling methodology at a dam involves determining the incipient conditions above the dam at the forebay monitoring station and below the dam in spillway releases at the tailwater fixed monitoring station. The project forebay monitors are intended to represent a mixed cross section in the river just upstream of the dam and can be a fair approximation of aquatic habitat conditions as defined by TDG and water temperature in that area of the pool. The tailwater instruments are located near the project and are generally positioned in the spillway releases, downstream of aerated flow and prior to complete mixing with powerhouse releases. These sampling stations enable the determination of project operations impacts on water quality conditions in the Columbia Basin.

There are two BiOp measures which effect the current monitoring program.

1. Bi-Op Measure RPA 143 – A data collection strategy is currently being developed to support a numerical modeling effort called for by this particular Bi-Op measure. A very complete temperature data set was collected in 2002 and another data set is scheduled and contracted to be gathered this year 2003.
2. BiOp Measure RPA 132 - Review of Forebay TDG and Temperature Monitors. Existing forebay monitors for gas and temperature are being examined in 2003 to determine if they represent the river cross-section. Initial indications are that the forebay monitors are biased or not representative of cross sectional river conditions due to their location and depth. A field study is currently underway with a report scheduled for completion by September 2003. The report may recommend relocation of some or all of these monitors. If so, relocation will occur in out-years pending funds availability.

Additional monitoring may also be needed to evaluate localized effects such as hot spots or cold water refugia that impact fish habitat needs. Detailed cross sectional and vertical transect temperature studies will be encouraged during the implementation phase to assess localized temperature effects of operational strategies and to support refined temperature modeling.

Long term monitoring activities will be required to develop data to support temperature management plans, operational and structural temperature enhancement measures, and compliance with the TMDL. The TMDL identifies the modeled natural river thirty-year average temperature (Nt) as the objective to meet current water temperature standards. The Nt is also

sited as a benchmark for determining the need to develop a temperature management plan. The comparison between synthesized temperatures (Nt) and observed river temperatures must take into account the stochastic nature and uncertainty of each parameter. The synthesized temperatures for a given river mile and time of year will vary between years as a function of the system hydrology and meteorology and thermal loadings. A statistical level of confidence will be needed in order to determine if observations of water temperature differ significantly from the selected numerical criteria. Therefore, one objective of the long term monitoring strategy will be to develop ways for determining compliance to state water quality regulations and temperature TMDL.

Potential Funding Sources

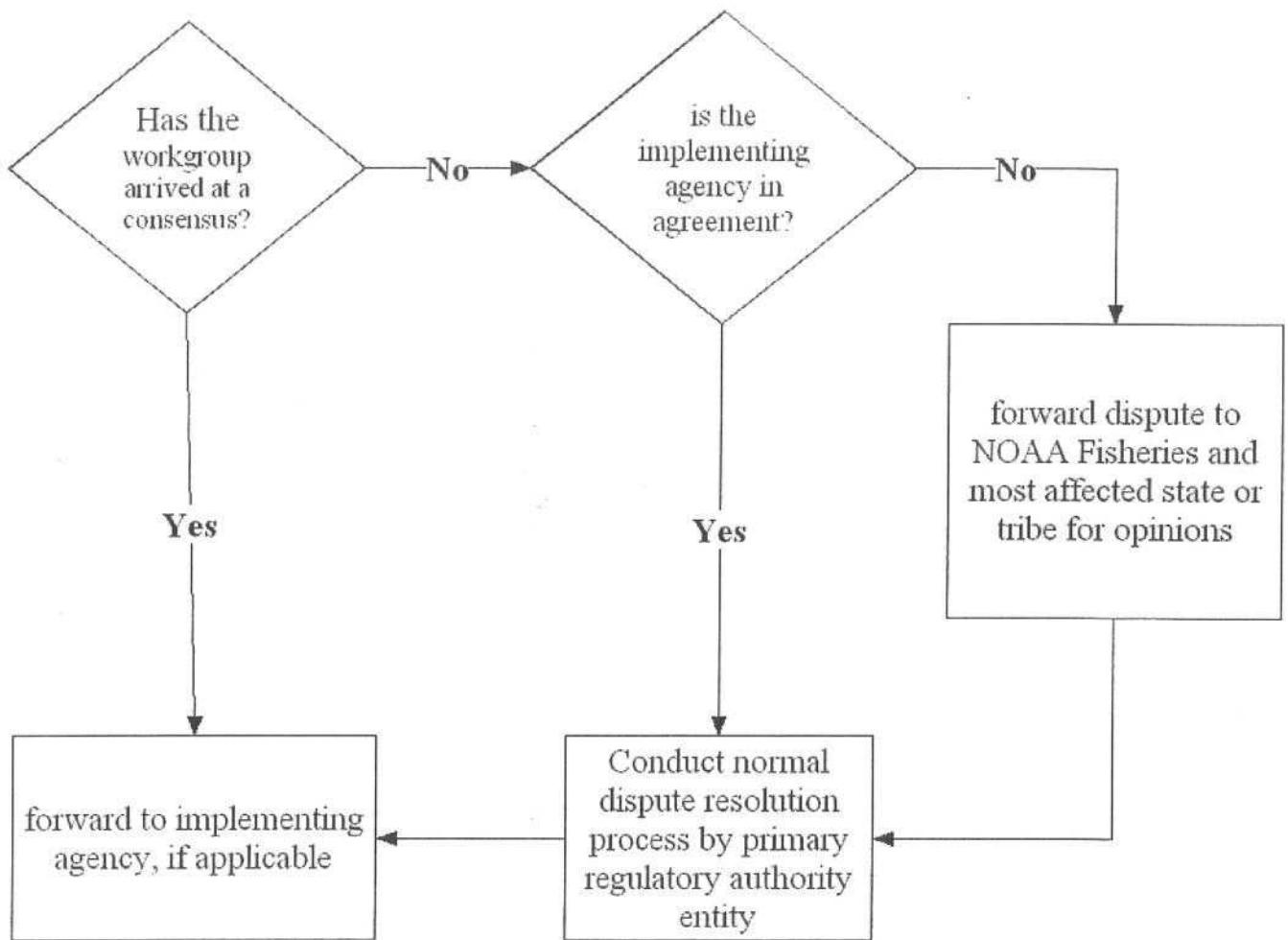
Funding for structural changes to the dam projects that directly benefit endangered species recovery through temperature reduction remains a possibility. Structural changes at some federal projects may require authorization funding from Congress. Funding for capital projects that are not linked to ESA? survival is uncertain.

Cultural Resources

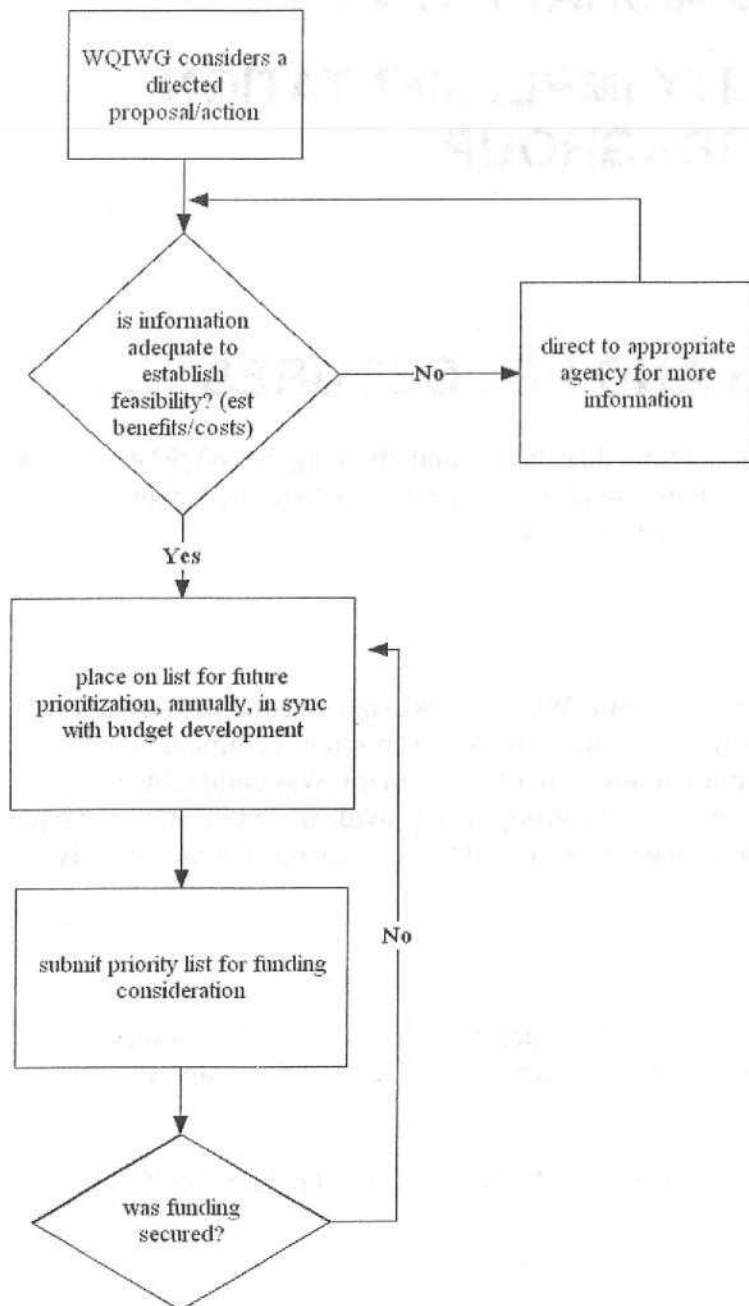
During the collaborative process of developing a DIP, the group will recognize the cultural resources that could be impacted by the measures being considered to reduce water temperature in the mainstem. As measures are evaluated for the costs, benefits, and impacts on other uses of the river, cultural resources, particularly those of the tribes in the region, will be considered. The tribes intend to be active participants in the implementation planning process and will provide the group with the necessary information about the impact of potential measures on tribal cultural resources.

The following diagrams and text are still negotiable and are included unchanged from the previous version.

Dispute Resolution



Prioritizing Potential Activities to Improve Temperature



COLUMBIA/SNAKE RIVER

WATER QUALITY IMPLEMENTATION WORKGROUP

GUIDELINES AND PROCEDURES

The BOR and the Corps I would suggest deleting this section and allowing the WQIPW to form their own guidelines and procedures, although I think adequate changes to reinforce the recommending-only nature of the group are now in place.

I. Purpose and Scope

Purpose: The Water Quality Implementation Team (WQIWG) is established to provide a forum for discussion, recommending actions and coordination of the sovereign governments working to implement hydro system related temperature improvements and other CWA compliance activities in the Columbia River. The purpose of the group is to provide an opportunity for input and thorough discussion of issues to inform federal, state and tribal agencies that are actively engaged in CWA compliance efforts.

II. Goals

- a) To ensure that the decision making process for operations and system configuration is open and, when agreement can not be reached, to ensure that the bases for water quality decisions are fully explained.
- b) To develop agreement on strategies to achieve WQS, including standards for TDG, temperature and toxics

III. Membership

Membership is open to tribal, state and federal agencies with regulatory or action authority in the Columbia River, including the National Marine Fisheries Service, U.S. Fish and Wildlife Service, Bonneville Power Administration, U.S. Army Corps of Engineers, Bureau of Reclamation, and the Environmental Protection Agency, the Mid-Columbia Public Utility Districts, etc.

IV. Participation and Representation

a) Members may participate, through designated representatives or their alternates, in all discussions of water quality; present proposals; register objection, concurrence, or abstention on ~~recomend~~ recommendations before the body. The members will make efforts to enable all represented members to have a meaningful opportunity to participate in the work of the WQIWG.

b) Members of WQIWG must be represented by a designated representative or alternates in order to participate in the forwarding of recommendations. The designated representative will generally be a policy oriented staff and the alternates will generally be technical staff in a supporting role.

V. Conduct of Meetings

a) The meetings will be chaired on a rotating annual basis by the designated representative or alternate of the states and tribes with direct water quality authority. Meetings may be facilitated by an impartial facilitator to allow all representatives full participation in discussions and to assure that all members have an equal opportunity to participate.

b) Only designated representatives or their alternates may register objection, concurrence or abstention on a recommendation or request that the issue be elevated to the next level. The Chair or a designated representative or alternate may call upon members and nonmembers to participate in discussions or make proposals.

c) When recommendations are proposed for adoption, the chair will identify, and the meeting notes will reflect, the member making the proposal. If an issue is to be decided, the chair will poll the members for their concurrence, objection or abstention and the basis for their position. If an issue is to be postponed or is otherwise resolved, the Chair will identify the further action or the resolution. The meeting notes will reflect the above information.

d) Meeting agendas will be developed by the meeting chair and facilitator, with member input, and distributed to the members at least one week prior to the meeting. Members wishing to include an issue on the agenda should provide a statement of the issue to be distributed with the agenda. Materials to be discussed at the meeting will be communicated to members at least one week before the meeting starts, preferably with the agenda, if not sooner. The agenda will clearly identify items that may be forwarded to the action agencies as recommendations.

e) Meeting notes will be taken at all meetings. The notes will be provided to members along with the agenda and materials for the next meeting, and approved at the next meeting.

f) Meetings of the WQIW will be open to the public. The chair may call for public comment as appropriate during the meetings. Time will be reserved at each meeting for members of the public to comment.

VI. Frequency of Meetings

The WQIWG will be convened when deemed necessary by a majority of the participating members and no less frequently than quarterly. The Committee may be convened by teleconference call, if appropriate.

VII. Decision-Making and Dispute Resolution

a) The goal of the WQIWG is to reach consensus on technical and policy issues whenever possible. Consensus is defined as the lack of strong objection. Participation in a consensus process implies that all members are actively participating in good faith and are searching for an accommodation of those interests represented at the table. The members will make all reasonable efforts to achieve consensus. When consensus cannot be achieved, the objecting member(s) may request that the issue be elevated as follows:

1. When consensus cannot be reached, a manager who can make decisions for the state or tribe with authority will indicate to the workgroup how they intend to proceed. The manager should indicate a tentative finding. When disputed issues are raised, any member may make presentations to help clarify the issues.
2. Members will make all reasonable efforts to present an issue in writing at least one week prior to the meeting at which they request that the issue be addressed.
3. When all efforts to achieve consensus have been made, the member or agency with authority to act will make the final decision and explain the rationale for that decision in writing before the next regularly scheduled meeting. Nothing in these rules alters the legal authorities of any of the parties.

b) Decisions will be made by those designated representatives or their alternates present and registering consent, objection, or abstention to a decision made at a noticed meeting or conference call.

c) Each member is responsible for having a designated representative or alternate present at the meeting (in person or by conference call) to register consent, objection, or abstention on a decision to forward a recommendation. Every effort will be made to ensure that those members who feel strongly about an issue can be present at the meeting at which the issue will be discussed.

VIII. Biannual Review of Procedures

- a) The WQIWG shall review these procedures bi-annually and make changes based on a consensus decision of the group.